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COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS

GROUP OF EXPERTS ON EXPLOSIVES

Seventeenth session
Geneva

REPORT OF THE GROUP OF EXPERTS ON ITS SEVENTEENTH SESSION

(8-12 August 1977)

Table of contents

	Paragraphs
ADOPTION OF THE AGENDA	2
ELECTION OF CHAIRMAN	3
PARTICIPATION OF A NON-GOVERNMENTAL ORGANIZATION IN THE WORK OF THE GROUP	4
COMPENDIUM OF RESOLUTIONS ADOPTED BY THE ECONOMIC AND SOCIAL COUNCIL CONCERNING THE TRANSPORT OF DANGEROUS GOODS	5 and 6
NEW ENTRIES IN CLASS 1	7 - 24
ADDITIONS TO PACKING SHEETS	25 - 32
TECHNICAL AND EDITORIAL REVISION OF THE RECOMMENDATIONS	33 - 41
WATER-WETTED EXPLOSIVES	42 - 44
DIVISION 1.5 AND APPROPRIATE TEST CRITERIA	45 - 52
REVISION OF TEST PROCEDURE	53
OTHER MATTERS	54 - 63
New structure of the Recommendations	54 and 55
Hazard information system (HIS)	56 - 58
Nitrocellulose	59
PETN, dry	60
Clarification of paragraph 4.9 (c) (ii)	61
Changes in figure 4.1	62
Changes in the definitions of Compatibility Groups E and F	63
NEXT SESSION AND FUTURE WORK	64 and 65
Annex 1 - New entries in Class 1	
Annex 2 - Amendments to the list and to the special provisions under certain entries	
Annex 3 - Packing of explosives	
Annex 4 - Amendments to chapter 4	

REPORT

1. The Group of Experts on Explosives held its seventeenth session at Geneva from 8 to 12 August 1977. Experts from the following countries participated in its work: Canada; France; Italy; Germany, Federal Republic of; Union of Soviet Socialist Republics; United Kingdom; United States of America. In pursuance of paragraph 7 of Economic and Social Council resolution 2050 (LXII) of 5 May 1977, those countries' members in the Committee of Experts had notified the Secretariat of their intention to participate and vote in the work of the Committee's subsidiary bodies. The Inter-Governmental Maritime Consultative Organization (IMCO), the Central Office for International Railway Transport (OCTI) and the International Civil Aviation Organization (ICAO) also took part in the work of the Group.

ADOPTION OF THE AGENDA

2. The Group adopted the provisional agenda proposed by the Secretariat (ST/SG/AC.10/C.1/R.1) and decided on the order for the discussion of the various items in accordance with a proposal by the expert from the United States of America.

ELECTION OF CHAIRMAN

3. Mr. E.G. WHITEHEAD (United Kingdom) was re-elected Chairman on the proposal of the expert from the United States of America, supported by the experts of the Union of Soviet Socialist Republics, Italy and France. The other experts signified their agreement by acclamation.

PARTICIPATION OF A NON-GOVERNMENTAL ORGANIZATION IN THE WORK OF THE GROUP

4. After consideration of the request submitted in document ST/SG/AC.10/C.1/R.7 by the Association européenne de pyrotechnie (AEP), the Group agreed to the participation of a representative of the Association solely in such of the Group's discussions as related to communications submitted by his Organization.

COMPENDIUM OF RESOLUTIONS ADOPTED BY THE ECONOMIC AND SOCIAL COUNCIL CONCERNING THE TRANSPORT OF DANGEROUS GOODS

5. The expert from the Union of Soviet Socialist Republics proposed that the resolutions on dangerous goods adopted by the Economic and Social Council and listed in the Foreword to the Recommendations (ST/SG/AC.10/1) should be grouped together in a single document and circulated by the Secretariat.

6. That proposal was adopted by the Group, and the Secretariat was requested to give effect to the decision, the Group being agreed that the Secretariat would be free not to include in the compendium the texts of purely incidental resolutions or of resolutions which had ceased to be pertinent.

NEW ENTRIES IN CLASS 1

7. The Group heard a statement by the representative of IMCO explaining the proposals contained in document ST/SG/AC.10/C.1/R.2.

8. The first question discussed by the Group was that of the classification of the diazo salts or compounds referred to in paragraphs 1 to 4 of the IMCO document. After a discussion in which, in particular, the experts from the Federal Republic of Germany, the United States of America and the United Kingdom took part, the Group agreed that diazo salts and possibly diazo compounds having the characteristics of Class 1 should be classified individually in that Class, and also that the Group of Rapporteurs should be requested to consider the question of diazo salts and compounds which might be included in Class 4. A note to that effect, based on a draft prepared jointly by the experts from the United States of America and the United Kingdom, was adopted by the Group for transmission to the Group of Rapporteurs (see annex 1 to this report).

9. The corrections requested by IMCO in paragraph 7 of its document were adopted by the Group, and the Secretariat was requested to incorporate them in the revised edition of the Recommendations now being printed. That decision did not have the effect of closing the discussion on the question of the carriage of trinitroresorcinol (styphnic acid) (C219) in the dry state, which question will, at the suggestion of the expert from the United Kingdom, be considered at the next session.

10. The suggestion in paragraph 3 was adopted, and the expert from the United States of America will prepare a general text introducing chapter 2 of the Recommendations; that text will be submitted for consideration at a future meeting of the Group.

11. Lastly, the correction proposed by IMCO in paragraph 9 was considered to be a matter for the Secretariat, which took note of it for the revised edition of the Recommendations.

12. The Group next considered the proposal by the expert from the Federal Republic of Germany to add to Class 1 isosorbide dinitrate (ISDN), a basic product used in the pharmaceutical industry (ST/SG/AC.10/C.1/R.4). The Group agreed to review the matter in the light of additional information to be provided by the expert from the Federal Republic of Germany. At the end of the discussion the Group took the view that the information sheet reproduced in annex 13 to the Committee's report on its ninth session (ST/SG/AC.10/2) should be modified as necessary so that known data relevant to the possible assignment of substances or articles to Class 1 could be included in it.

13. The Group considered the proposals by the expert from the United States of America, as set forth in section I (a), (b), (c) and (d) and section VII (1) of document ST/SG/AC.10/C.1/R.6, concerning new entries in Class 1.

14. It was agreed to add to the list the six items in section I, paragraph (a) without any reference to a "special provision", the proposal at the end of the paragraph for a special provision being thereby disposed of.

15. The addition proposed in paragraph (b) was not adopted, the Group having agreed to revert to the question of a new description for "Boosters (mines)", the present wording of which in paragraph 4.60 of the Recommendations relates only to articles of this kind used for military purposes. The extension to include articles of a commercial nature will be linked to the method of packing.

16. The Group finally took the view that it would also be desirable to revert to the question of the entries, and it agreed to amend entries 0042, 0225, 0268 and 0283 and the present description (see annexes 2 and 4 to this report), and to replace packing method E 107 by an amended method, also numbered E 107, applicable to items 0042 and 0283 (see annex 3 to this report).

17. The first two substances referred to in paragraph (c) will be added to the list; dipicryl sulphide with the reservation that retention of the reference to special provision 15 is subject to consideration by the Group of Rapporteurs of the possible toxicity of this substance; and ammonium perchlorate, as proposed.

18. The proposal concerning fusees, rail and highway, was withdrawn by its sponsor.

19. The expert from the United States of America stated that the proposal submitted under (d), which was in essence a proposal to establish a list of substances and articles whose carriage was prohibited, could be dealt with in the context of an introduction to chapter 2 of the Recommendations. The opinions both of the experts and of the representatives of the international organizations concerned had stressed the innovatory character of the proposal, which implied a change in the principle hitherto followed by reason of recommendation 1.30 and would make it impossible to reach a constructive conclusion. The expert from the United States of America withdrew his proposal, which he would review in the light of the opinions expressed.

20. It emerged from the consideration of section VII, paragraph (m), that part of the problem could be solved, without adding new items to the list itself, by a judicious use of the index; the experts from the United States of America and the United Kingdom applied themselves to doing so (see annex 2 to this report).

21. However, as that method had been found inapplicable to the rest of the problem, the proposal made was that two new entries should be established for "Flares, aerial", i.e. numbers 0403 and 0404, and that a reference to "Flares, aeroplane" should be inserted in the index. A new entry was also established for "Flares, signal" (0405) (see annex 2 to this report).

22. In view of the question's close connexion with the index, the Group took the view that the question raised in section VII, paragraph (l), would be solved by deleting from the English version of the index the line "Caps, toy, see 0022", which had been retained by mistake although 0022 had been deleted from the list. The Secretariat will make this deletion in the revised version being printed.

23. Finally, the last question raised in document ST/SG/AC.10/C.1/R.6, i.e. that dealt with in section VII (m), was settled by an insertion in the index referring to a series of entries.

24. All the provisions adopted by the Group with respect to the list will be found in annex 2 to this report. */

ADDITIONS TO PACKING SHEETS

25. The Group considered those sections of the paper submitted by the expert from the United States of America (ST/SG/AC.10/C.1/R.6) which concerned packagings.

26. In accordance with the proposal made under section I (b), a new packing sheet E 107 was adopted, as mentioned in paragraph 16 above.

27. In addition, the proposal in section V was accepted and adopted in the form indicated in annex 3 to this report, i.e. by an addition to paragraph 10.2 of the Recommendations.

28. Lastly, the Group felt it necessary to make it quite clear, wherever the sheets recommended prevention of movement, that the reference was to "significant" movement.

29. The provisions and amendments concerning packing are reproduced in annex 3 to this report.

30. The expert from the United States of America drew the attention of the Group to the fact that the last of the requirements for ensuring the waterproofness of bags made of plastics fabrics (type 5HIC) was impracticable. The Group took the view - particularly after the explanations provided by the expert from Italy, who had proposed the insertion of the requirements concerning these bags in the Recommendations - that the provisions under 5HIC should be the same, so far as the specifications were concerned, as those applicable to textile bags of type 5LIC.

31. The Group of Experts requested the Group of Rapporteurs to consider whether the provisions criticized should be amended on those lines.

32. The Group examined a conference room paper, submitted by the expert from the United Kingdom, concerning the packing of black powder (gunpowder) and seeking acceptance of the use of cotton bags as an inner packaging. The proposal was withdrawn, the matter being already covered by the existing provisions.

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*/ Note by the Secretariat: The corrections referred to in paragraphs 9, 11, 22, 34, 37, 40 and 41 of this report have not been reproduced in this annex. They have been communicated by the Secretariat to the Printing Section, which has incorporated them in the proofs of the English and French versions. The same procedure has been adopted for the amendments made to the French text of certain entries.

TECHNICAL AND EDITORIAL REVISION OF THE RECOMMENDATIONS

33. The Group considered the document submitted by the expert from the Federal Republic of Germany (ST/SG/AC.10/C.1/R.5). The Group agreed, as proposed, to the deletion of entry 0088. After a discussion on paragraph 2.2 it became apparent that all the descriptions in chapter 4 of the Recommendations should be recast. In the circumstances, the expert from the Federal Republic of Germany withdrew the proposals in paragraphs 2.2 and 2.3 of his document.

34. The expert from the United Kingdom raised a number of questions concerning minor corrections to be made to the text of the Recommendations. The expert from the Union of Soviet Socialist Republics recalled the proposals contained in document E/CN.2/CONF.5/R.611, annex 2, which also contained some proposed editorial corrections to be made to the text of chapters 2 and 3 of the Recommendations. Those corrections will be taken into account by the Secretariat in the revised edition (paragraphs 4.11, 13.5 and 13.17).

35. In addition, at the suggestion of the United Kingdom expert the Group instructed a small group to undertake a rearrangement of the first few paragraphs of chapter 4. The work of the small group is the subject of document ST/SG/AC.10/C.1/R.8, which will be considered at the Group's next session.

36. The Group examined the parts of document ST/SG/AC.10/C.1/R.6, submitted by the expert from the United States of America, which related to the agenda item concerned.

37. The proposals made in section VI (b), subparagraphs (i), (ii), (iii) and (v), were adopted; since they are solely concerned with matters of drafting, the Secretariat was requested to take them into account in the revised editions currently printing.

38. The proposal made in section VII, paragraph (a), gave rise to a discussion on the extent to which the Group could make changes in the revised editions currently printing without waiting for the Committee's approval.

39. A first reading made it clear that the question raised in the document submitted by the expert from the United States of America, and those raised in annex 2 to document E/CN.2/CONF.5/R.611 submitted by the expert from the Union of Soviet Socialist Republics, did not raise any questions of substance and were of the kind with which the Secretariat frequently had occasion to deal.

40. Suggestions by the Secretariat to settle those points were adopted and the Secretariat was requested to incorporate the corrections adopted in the revised edition currently printing (the purpose of those corrections being to eliminate redundant notes from chapter 3 of the Recommendations).

41. The proposals made in section VII (c) of the document submitted by the expert from the United States of America were adopted and the Secretariat will take them into account in the revised edition being prepared.

WATER-WETTED EXPLOSIVES

42. A single communication had been submitted on this subject (ST/SG/AC.10/C.1/R.6, section IV), seeking the Group's view on the carriage of water-wetted explosives by air.

43. The expert from the United Kingdom expressed the view that such carriage should be permitted on cargo aircraft.

44. The expert from the United States of America drew attention to some proposals made in document ST/SG/AC.10/C.2/R.13, addressed to the Group of Rapporteurs, which were of concern to the Group of Experts since they related to explosives for which the percentage of water had been set at 10 per cent (sodium picrate, trinitroaniline and 2,4-dinitrophenylhydrazine). The Secretariat will, if it should be found necessary, prepare an excerpt from that document for the next session of the Group of Experts, at which the question of the percentage of water is to be considered in detail.

DIVISION 1.5 AND APPROPRIATE TEST CRITERIA

45. For its consideration of the item the Group had before it a proposal by the expert from the Federal Republic of Germany (ST/SG/AC.10/C.1/R.3) and a proposal by the expert from the United States of America (ST/SG/AC.10/C.1/R.6, section II (b)).

46. The proposals were respectively introduced by the expert from the Federal Republic of Germany and the expert from the United States of America, who answered questions and furnished information on their experience in that highly-specialized field.

47. The expert from the United States of America pointed out that the test proposed in his document would be additional to the fire test and would accordingly mark a further step towards a better definition of division 1.5.

48. The expert from Canada circulated a paper outlining the findings - already reported orally - of studies and experiments carried out in his country.

49. The expert from the Federal Republic of Germany said that a test of the kind proposed by the expert from the United States of America merited close consideration. He concluded his statement by requesting that the matter should be studied by a small group.

50. The Group agreed to that proposal, and the expert from Canada invited the small group to meet in his country early in May 1978. He was warmly thanked for his invitation.

51. The small group's terms of reference were defined as being:

(a) to identify the most hazardous substance that could be included in division 1.5;

(b) to consider in detail, and enumerate, the test procedures available for distinguishing between division 1.5 and the other divisions of Class 1;

(c) to recommend to the Group of Experts on Explosives those among the aforesaid procedures that might be adopted because of their practical applicability and reproducibility.

52. It was agreed that those terms of reference should be flexibly interpreted.

REVISION OF TEST PROCEDURE

53. The expert from the United Kingdom, after describing tests carried out on various types of ammunition, said that he would submit a document for the next session, and also a film showing experiments carried out on articles that were at the boundary of division 1.4 S.

OTHER MATTERS

New structure of the Recommendations

54. The Group considered with interest the proposals - other than the suggestions in annex 2, which had already been adopted - set out in document E/CN.2/CONF.5/R.611, submitted by the expert from the Union of Soviet Socialist Republics. It took the view that, while the subject as a whole came more properly within the purview of the Group of Rapporteurs, the Group of Experts should nevertheless be entitled to express itself on certain items, such as those dealt with in annex 1, paragraphs 2.1, 3.2 and 5.2, and the whole of annex 4, and should in any case examine the entire draft as revised by the Group of Rapporteurs.

55. In that connexion the Group considered that the amendments proposed for chapter 10 of the Recommendations were desirable.

Hazard information system (HIS)

56. In connexion with the information given by the expert from the United States of America in section VII (g) of document ST/SG/AC.10/C.1/R.6, the expert from the United Kingdom submitted a conference room paper containing his proposals for the determination of code numbers for explosives by the system recommended for other dangerous goods.

57. The experts from the United States of America and the Union of Soviet Socialist Republics stated that for the time being no HIS code number was necessary for substances and articles of Class 1.

58. After a long discussion the Group agreed that the system used by the Group of Rapporteurs was not suitable for explosives. It would inform the Committee of that decision.

Nitrocellulose

59. The Group examined the proposal concerning nitrocellulose made in section VII (b) of the document submitted by the expert from the United States of America. The proposal to add a new note was adopted, the note taking the form shown in annex 2 to this report.

PETN, dry

60. The Group considered the proposal, made by the expert from the United States of America in section VII (d) of his document, for deletion of the last sentence in paragraph 4.1 (b) of the Recommendations. After discussion, the Group adopted the amendment shown in annex 4 to this report. A proposal that dry tetryl should be adopted as a reference standard was discussed, but it was agreed that a more detailed discussion concerning tetryl would have to be deferred until the next session.

Clarification of paragraph 4.9 (c) (ii)

61. The proposal by the expert from the United States of America in section VII (i) of his paper was adopted (see annex 4 to this report).

Changes in figure 4.1

62. The proposal in section VII (j) of that paper was accepted as a necessary consequence of a decision taken earlier concerning classification (see annex 4 to this report).

Changes in the definitions of Compatibility Groups E and F

63. The Group considered the proposal made in document ST/SG/AC.10/C.1/R.6, section VII (k). The proposal was adopted (see annex 4 to this report).

NEXT SESSION AND FUTURE WORK

64. The next session of the Group will take place during the summer of 1978. It was recalled that an informal meeting would be held in Canada at the beginning of May 1978 to consider the problems relating to division 1.5 referred to in paragraph 51 of this report.

65. The Group decided to place the following questions on the provisional agenda for its next session:

New entries in Class 1;

Additions to packing sheets (to take account of technological developments);

Technical and editorial revision of chapters 4 and 10 of the Recommendations;

Water-wetted explosives (hexolite, octolite, pentolite, nitroguanidine with not less than 15 per cent water, which are not in division 1.1);

Entries in division 1.5 and appropriate test criteria;

Other matters.

Annex 1

NEW ENTRIES IN CLASS 1

Note to the Group of Rapporteurs*/

1. The Group of Experts informs the Group of Rapporteurs that it is not prepared to enter DIAZONIUM SALTS AND DIAZO COMPOUNDS, n.o.s., in Class 1. If there is a need to include individual substances of this type in Class 1, each substance should be considered individually, and it will be necessary for the Group to be supplied with information as to the substance's properties and the type of packaging proposed.

2. The Group of Experts recommends the Group of Rapporteurs should the latter wish to include DIAZONIUM SALTS AND DIAZO COMPOUNDS, n.o.s., in Class 4 or in the divisions within Class 4, to adopt provisions to the effect that such substances should not have explosive properties. The Group would suggest that no substance should be so classified unless the national competent authorities concerned are satisfied that the substance has been tested and proved to:

(a) be less sensitive to ignition on impact than m-dinitrobenzene; and to

(b) burn, without exploding, when heated to its decomposition temperature in air.

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*/ The Group of Rapporteurs has agreed to consider the question at its twenty-first session (March 1978).

Annex 2

AMENDMENTS TO THE LIST AND TO THE SPECIAL PROVISIONS UNDER CERTAIN ENTRIES

(ST/SG/AC.10/1, chapters 2 and 3),

as adopted by the Group

I. New entries

Number	Designation	Class Division	Subsidiary Risks	Special Provisions	Packing Method
0395	ROCKET MOTORS, LIQUID FUELLED	1.2 J	+	-	E 103
0396	ROCKET MOTORS, LIQUID FUELLED	1.3 J	+	-	E 103
0397	ROCKETS, LIQUID FUELLED, with bursting charge	1.1 J	+	-	E 103
0398	ROCKETS, LIQUID FUELLED with bursting charge	1.2 J	+	-	E 103
0399	BOMBS, CONTAINING INFLAMMABLE LIQUID, with bursting charge	1.1 J	+	-	E 103
0400	BOMBS, CONTAINING INFLAMMABLE LIQUID, with bursting charge	1.2 J	+	-	E 103
0401	DIPICRYL SULPHIDE	1.1 D	+	15 */	E 2
0402	AMMONIUM PERCHLORATE having average particle size of less than 45 microns	1.1 D	+	-	E 2
0403	FLARES, AERIAL	1.4 G	+	-	E 133
0404	" "	1.4 S	+	-	E 133
0405	CARTRIDGES, SIGNAL	1.4 S	+	-	E 115

*/ The Group of Experts on Explosives asked the Group of Rapporteurs whether dipicryl sulphide had toxic properties. At its twentieth session the Group of Rapporteurs replied that it lacked adequate information on the substance's toxicity, and it agreed to include in the list a new entry covering this substance when the latter contained more than 10 per cent water and was carried in small quantities.

II. Amendments to the list

0042 Read:

"0042 BOOSTERS* 1.1 D + - E 107".

0088 Delete the entry.

0225), 0268), 0283) Delete the word "(gaines)" from the text of these entries.

0342), 0343) In the "Special provisions" column, insert "105".

III. Addition to chapter 3

Add the following note:

"105. Nitrocellulose with not less than 25 per cent alcohol by weight, or with not less than 18 per cent plasticizing substance by weight, and not exceeding 12.6 per cent nitrogen by dry weight, packed in receptacles so constructed that explosion by reason of increased internal pressure is not possible, may be appropriately classified in division 4.1 (Serial number 2556 or 2557).".

Index

Add to index:

"Flares, aeroplane, see 1.3 G 0093
see 1.4 G 0403
see 1.4 S 0404
Flares, signal, see 1.4 S 0405
Fuzes, see 1.1 B 0106
combination, percussion, time, see 1.2 B 0107
see 1.4 B 0257
see 1.4 S 0367
see 1.3 G 0316
see 1.4 G 0317 and
see 1.4 S 0368"

Annex 3

PACKING OF EXPLOSIVES
(see ST/SG/AC.10/1)

Amendments adopted by the Group

Chapter 10, paragraph 10.2

Add a fifth subparagraph to paragraph 10.2 (page 207):

"Where boxes of ordinary natural wood are specified, plywood or reconstituted wood may be substituted for that material provided that they are compatible with the explosive carried."

Chapter 10: Packing methods for explosives

Insert "significant" before "movement" in the following packing methods:

E102, E106, E108, E112, E113, E114, E117, E118, E122, E123, E124, E126, E129, E130, E131, E132, E133, E134, E136, E137, E138, E139, E140, E141, E142, E145, E146, E148, E149, E150, E152, E154 and E157.

Chapter 10: Packing method E.107

Replace by the following:

"Method E107

(a) Boosters which are finished articles consisting of closed metal, plastics or fibreboard receptacles that contain a detonating explosive, or consisting of a plastics-bonded detonating explosive.

Packagings

Inner: Not necessary

Outer: Boxes

fibreboard (4G1)
natural wood, ordinary (4C1)

(b) Cast or pressed boosters in tubes or capsules without end closures

Packagings

Inner: Receptacles

fibreboard
metal
plastics

Sheets

plastics
paper

Outer: Boxes

fibreboard (4G1)
natural wood, ordinary (4C1)"

Annex 4

Amendments to chapter 4

"SPECIAL RECOMMENDATIONS RELATING TO CLASS 1"

(ST/SG/AC.10/1)

adopted by the Group

4.1(b) Replace the last sentence by:

"The carriage of explosive substances whose sensitivity to friction and impact is equal to or greater than that of dry PETN should be prohibited except where specially authorized.

4.2(c)(ii) In the last sentence, replace "Division 1.2," by "Division 1.1 or 1.2,".

4.10 In the first line, replace "thirty-one" by "thirty-three".

4.68 The description of "Boosters (gaines)" should be replaced by:

"Boosters

Articles containing a detonating explosive and used to increase the initiating power of detonators or detonating cord (fuse).".

Figure 4.1 In column "J" insert "1.1 J" opposite Hazard Division "1.1" and insert "1.2 J" opposite Hazard Division "1.2".

Figure 4.2 The definitions of Compatibility Groups E and F should be amended as follows:

(a) Compatibility Group E. Add at the end of the definition: "(other than one containing an inflammable or hypergolic liquid)".

(b) Compatibility Group F. Read: "Article containing secondary detonating explosive, with its own means of initiation, with a propulsive charge (other than one containing an inflammable or hypergolic liquid) or without a propulsive charge.".